Patent claims

1. A conduit component for a power supply network, comprising at least one first conduit for an at least partially liquid cryogenic energy carrier and at least one second conduit for a heat transfer medium liquid at the temperature of the liquid cryogenic energy carrier, said second conduit running parallel to the first conduit, and also heat exchangers, which are provided at the ends of the second conduit and are in thermal contact with the first conduit, for evaporating or condensing the heat transfer medium during the extraction of the cryogenic medium from or during its introduction into the first conduit.

2. The conduit component as claimed in claim 1, characterized in that microheat exchangers are provided as the first and/or second heat exchanger.

3. The conduit component as claimed in claim 1, characterized in that the inside diameter of the first conduit is smaller than or equal to 20 mm, preferably smaller than or equal to 2.5 mm.

4. The conduit component as claimed in claim 3, characterized in that the inside diameter of the second conduit is smaller than or equal to 20 mm, preferably smaller than or equal to 2.5 mm.

5. The conduit component as claimed in claim 1, characterized in that this is installed within an already existing supply conduit.

6. The conduit component as claimed in claim 1, characterized in that the first conduit is connected to at least one store for cryogenic energy carrier and to at least one consumer for cryogenic energy carrier, a

storage vessel for cryogenic energy carrier being connected, if appropriate, directly upstream of the consumer.

7. The conduit component as claimed in claim 1, characterized in that the first and second conduit run, along their entire length, in a thermally insulating environment.

8. The conduit component as claimed in claim 1, characterized in that cryogenic buffer vessels are provided at the conduit ends and/or at nodal points.

9. The conduit component as claimed in claim 1, characterized in that the material of the first and second conduit is metal or plastic.

10. The conduit component as claimed in claim 9, characterized in that the first and second conduits are selected such that they are flexible at room temperature.

11. The conduit component as claimed in claim 1, characterized in that this comprises a third conduit running parallel to the first and second conduit.

12. The conduit component as claimed in claim 11, characterized in that the third conduit is provided for the transport of evaporated cryogen medium and is connected to the first conduit.

13. The conduit component as claimed in claim 1, characterized in that this has a first, second and, if appropriate, third conduit running parallel to one another, at least the first conduit, preferably the first and the second conduit, being sheathed by at least two spaced-apart insulation foils which form an evacuatable space in which a material, preferably

carbon dioxide, solidifying by condensation at low temperatures and/or a gas removable by adsorption onto a getter material and also a getter material are located, and the first, second and, if appropriate, third conduit and insulation foils being surrounded by a thermally insulating sheath.

14. The conduit component as claimed in claim 13, characterized in that at least one of the insulation foils is coated with a thin metal layer.

15. The conduit component as claimed in claim 13, characterized in that the first, second and, if appropriate, third conduits are additionally also sheathed with a layer of thermally insulating material, preferably foam material.

16. The conduit component as claimed in claim 13, characterized in that the evacuatable space formed between the insulation foils also contains, in addition to the condensable gas, a finely particulate insulation material, in particular powdered silicic acid, mineral fibers or finely particulate foam materials.

17. The conduit component as claimed in claim 13, characterized in that the first and, if appropriate, the second and/or the third conduit is/are additionally sheathed with a layer of thermally insulating material, preferably foam material.

18. The conduit component as claimed in claim 1, characterized in that two or more pipelines from the first and second conduit are combined in a composite structure.

19. The conduit component as claimed in claim 1, characterized in that a multifunction conduit is provided, in which, in addition to the first and second

conduit, further conduits for material, current and/or signal transport are provided.

20. The conduit component as claimed in claim 18, characterized in that, in addition to the first and second conduit, a third conduit for the return transport of the gaseous heat transfer medium from the first heat exchanger to the second heat exchanger is provided, which is thermally insulated from the first and second conduit.

21. The conduit component as claimed in claim 18, characterized in that the first and/or second conduit contains/contain a superconducting material, and/or in that a further conduit containing superconducting material is provided.

22. The conduit component as claimed in claim 18, characterized in that the first and/or second conduit is/are designed as electrically conducting individual conduits which are provided with an electric insulation and are used as electrical conductors for current and/or signal transmissions.

23. The conduit component as claimed in claim 1, characterized in that the first conduit is coated at the location of the second heat exchanger and/or at the locations of the discharge of hydrogen from the first conduit into the third conduit with a catalyst for the conversion of parahydrogen into orthohydrogen.

24. A method for the conduit transport of cryogenic energy carriers, comprising the steps:

i) feed of a gaseous and/or liquid cryogenic energy carrier into a first conduit,
ii) condensation or cooling of the liquid cryogenic energy carrier at the location of the feed into the first conduit by transmission of thermal

energy from the cryogenic energy carrier to a liquid heat transfer medium in a second conduit which is connected to a first heat exchanger, with the result that the heat transfer medium evaporates and is discharged from the second conduit,

iii) transport of the liquid cryogenic energy carrier through the first conduit.

iv) transport of the liquid heat transfer medium through the second conduit in countercurrent to the cryogenic energy carrier,

v) evaporation of the liquid cryogenic energy carrier at the location of the discharge from the first conduit by transmission of thermal energy from the gaseous heat transfer medium to the liquid cryogenic energy carrier in the first conduit which is connected to a second heat exchanger, with the result that the heat transfer medium condenses and is fed into the second conduit, and

vi) discharge of the gaseous cryogenic energy carrier from the first conduit.

25. The method as claimed in claim 24, characterized in that the gaseous heat transfer medium is introduced from the surroundings into the second conduit at the location of the second heat exchanger and is discharged into the surroundings at the location of the first heat exchanger.

26. The method as claimed in claim 24, characterized in that the gaseous heat transfer medium is recirculated, in a third conduit which is thermally insulated from the first and second conduit, from the first heat exchanger to the second heat exchanger and is fed there in condensed form into the second conduit again.

27. The method as claimed in claim 24, characterized in that the cryogenic energy carriers used are hydrocarbons gaseous at room temperature and/or hydrogen, in particular methane, ethane, propane, butane or their mixtures, preferably natural gas and, most especially preferably, hydrogen.

28. The method as claimed in claim 24, characterized in that the heat transfer medium used is nitrogen or, in particular, air.

29. The method as claimed in claim 24, characterized in that gaseous energy carrier which has occurred due to the evaporation of cryogenic energy carrier is transported in a third conduit running parallel to the first and second conduit.

30. The method as claimed in claim 29, characterized in that gaseous energy carrier transported in the third conduit is combined at the location of the consumer with the evaporated energy carrier discharged from the first conduit.

31. The method as claimed in claim 29, characterized in that the gaseous energy carrier transported in the third conduit is condensed at the location of the feed of the cryogenic energy carrier into the first conduit and is fed, together with this, into the first conduit.

32. A use of the conduit component as claimed in claim 1, for supplying commercial or private consumers, in particular filling stations, industrial companies, houses or dwellings, with cryogenic energy carriers, in particular with natural gas or hydrogen.

33. A pipeline for transport of cryogenic liquids, comprising a first, second and, if appropriate, third conduit running parallel to one another, at least the

first conduit, preferably the first and the second conduit, being sheathed by at least two spaced-apart insulation foils which form an evacuatable space in which a material, preferably carbon dioxide, solidifying by condensation at low temperatures and/or a gas removable by adsorption onto a getter material and also a getter material are located, and the first, second and, if appropriate, third conduit and insulation foils being surrounded by a thermally insulating sheath.

34. The pipeline as claimed in claim 33, characterized in that at least one of the insulation foils is coated with a thin metal layer.

35. The pipeline as claimed in claim 33, characterized in that the first conduit is coated partially or completely with a catalyst for the conversion of parahydrogen into orthohydrogen.

36. The pipeline as claimed in claim 33, characterized in that the first, second and, if appropriate, third conduit are additionally also sheathed with a layer of thermally insulating material, preferably foam material.

37. The pipeline as claimed in claim 33, characterized in that the evacuatable space formed between the insulation foils also contains, in addition to the condensable gas, a finely particulate insulation material, in particular powdered silicic acid, mineral fibers or finely particulate foam materials.

38. The pipeline as claimed in claim 33, characterized in that the first and, if appropriate, the second conduit is/are also additionally sheathed with a layer of thermally insulating material, preferably foam material.

39. The pipeline as claimed in claim 33, characterized in that further conduits for material, current and/or signal transport are provided.

40. The pipeline as claimed in claim 33, characterized in that, in addition to the first and second conduit, a third conduit for the transport of gaseous heat transfer medium or evaporated gaseous cryogenic energy carrier is provided, which is preferably thermally insulated from the first and second conduit.

41. The pipeline as claimed in claim 33, characterized in that the first and/or second conduit contains/contain a superconducting material, and/or in that a further conduit containing superconducting material is provided.

42. The pipeline as claimed in claim 33, characterized in that the first and/or second conduit is/are designed as electrically conducting individual conduits which are provided with an electrical insulation and are used as electrical conductors for current or signal transmissions.

43. A composite structure, comprising two or more pipelines as claimed in claim 33.

44. A power supply network, comprising at least one conduit component as claimed in claim 1.